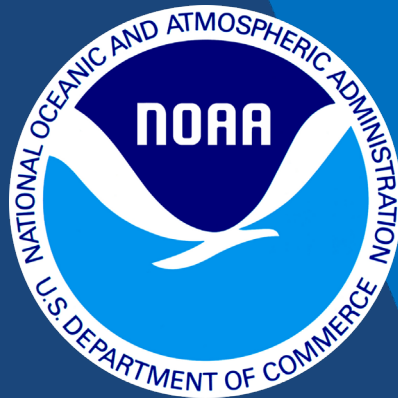


NOAA Climate Science and Services Monthly Climate Update



Russell Vose

Climatologist, NOAA National Centers for
Environmental Information

Alan Haynes

Hydrologist in Charge, NOAA/NWS California
Nevada River Forecast Center

Brad Pugh

Meteorologist, NOAA Climate Prediction Center

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Atmospheric Administration

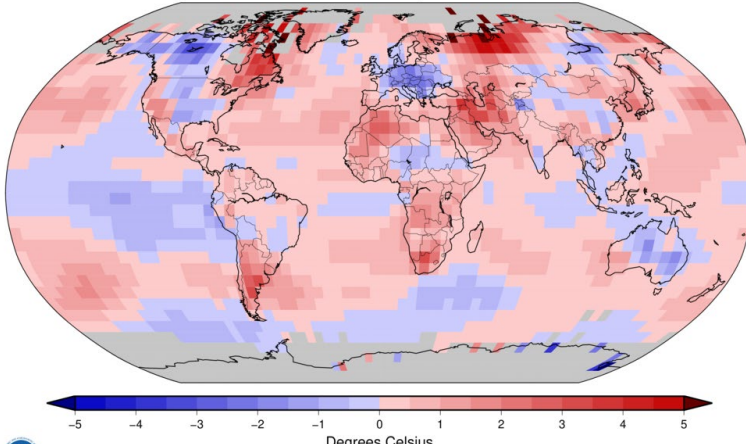
May 2021



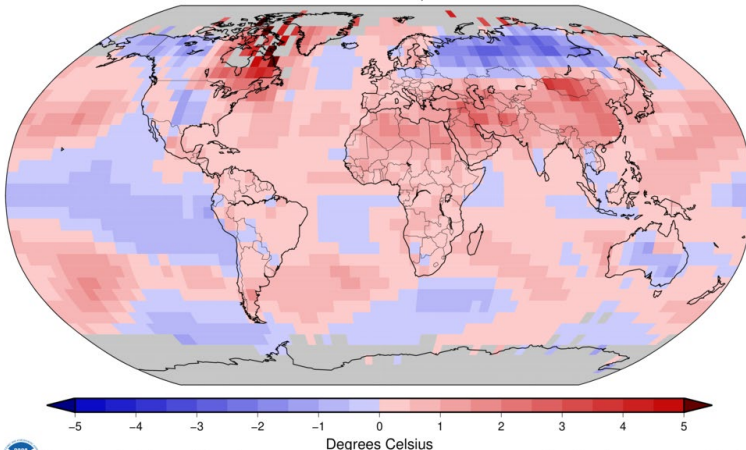
Global Temperature

The global temperature record dates back to 1880 (142 years)

Land & Ocean Temperature Departure from Average Apr 2021
(with respect to a 1981–2010 base period)
Data Source: NOAA GlobalTemp v5.0.0–20210509



Land & Ocean Temperature Departure from Average Jan–Apr 2021
(with respect to a 1981–2010 base period)
Data Source: NOAA GlobalTemp v5.0.0–20210509



April 2021

- **Global Land & Ocean:** $+0.79^{\circ}\text{C}$ / $+1.42^{\circ}\text{F}$; 9th warmest on record, coldest since 2013.
- **Global Land:** $+1.25^{\circ}\text{C}$ / $+2.25^{\circ}\text{F}$; 12th warmest on record.
- **Global Ocean:** $+0.62^{\circ}\text{C}$ / $+1.12^{\circ}\text{F}$; 8th warmest on record.

Year to Date 2021

- **Global Land & Ocean:** $+0.77^{\circ}\text{C}$ / $+1.39^{\circ}\text{F}$; 8th warmest on record, coldest since 2014.
- **Global Land:** $+1.27^{\circ}\text{C}$ / $+2.29^{\circ}\text{F}$; 10th warmest on record.
- **Global Ocean:** $+0.57^{\circ}\text{C}$ / $+1.03^{\circ}\text{F}$; 8th warmest on record.

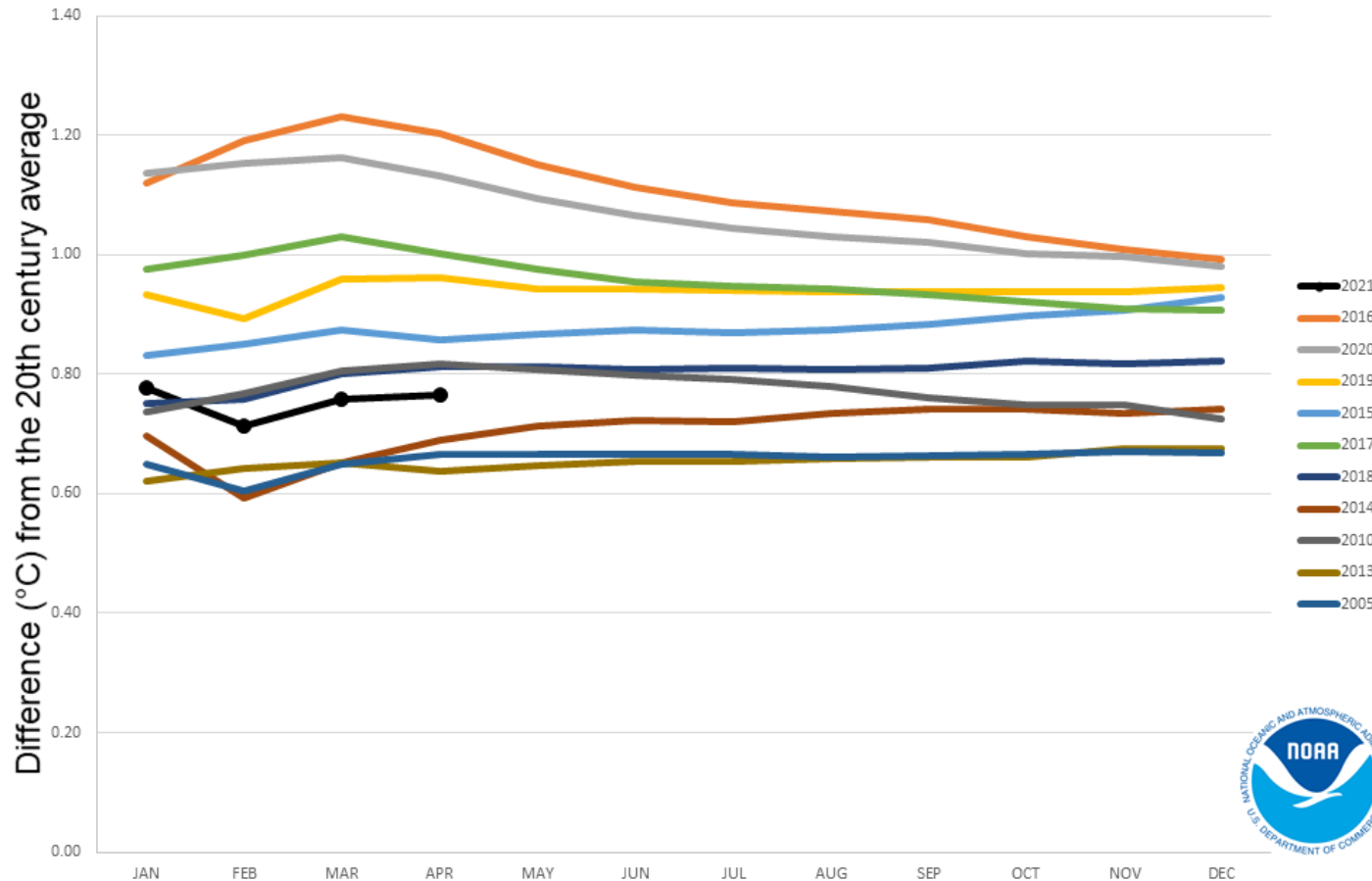


Global Temperature

The global temperature record dates back to 1880 (142 years)

Year-to-Date Global Temperatures

for 2021 and the ten warmest years on record



January–April 2021

2021 currently has a ...

- <1% chance of being warmest
- <4% chance of being in the top 5
- >99% chance of being in the top 10



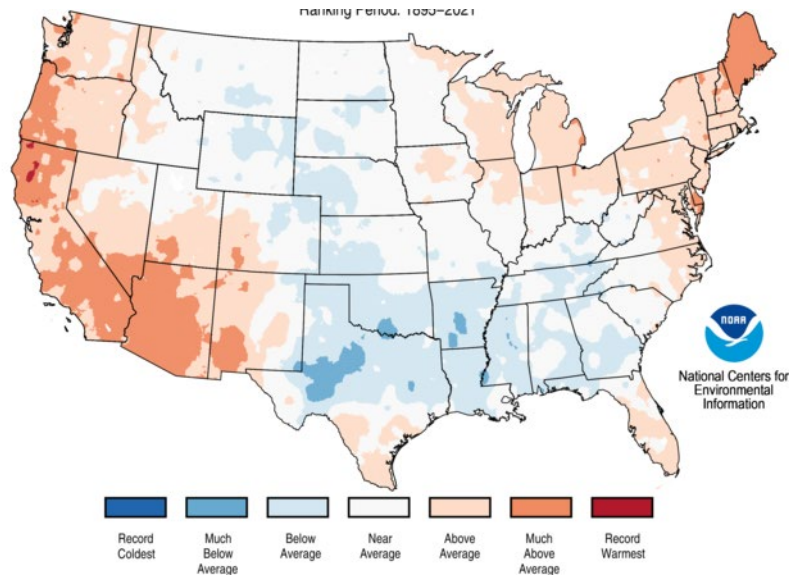
Contiguous U.S. April 2021

Temperature: 51.9°F, +0.9°F, “near average”

Precipitation: 2.03”, -0.49”, 14th driest April

Temperature Percentiles April 2021

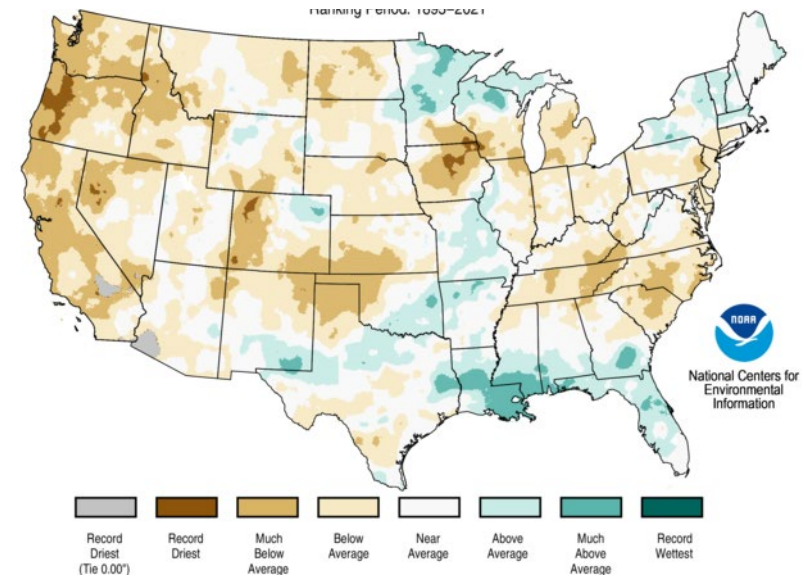
Period: 1895-2021 (127 years)



- Above average across much of the West Coast, Southwest, Northeast, Great Lakes, parts of South
- Below average across much of the Southern and Northern Great Plains, South, and Southeast
- Near-average for Alaska (cooler in interior, warmer in Aleutians)

Precipitation Percentiles April 2021

Period: 1895-2021 (127 years)



- Majority of Lower 48 below average; Oregon 3rd driest, California 5th driest
- Above average over parts of Great Lakes, New England, Midwest, Southern Plains, and Gulf Coast
- Above average for Alaska as a whole

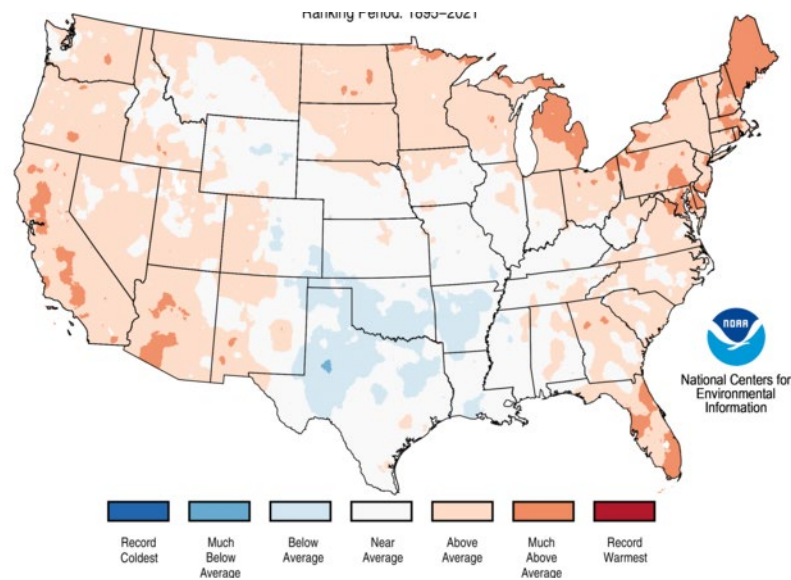
Contiguous U.S. January-April 2021

Temperature: 40.7°F, +1.6°F, warmest third of record

Precipitation: 8.63", -0.85", driest third of record

Temperature Percentiles Jan-Apr 2021

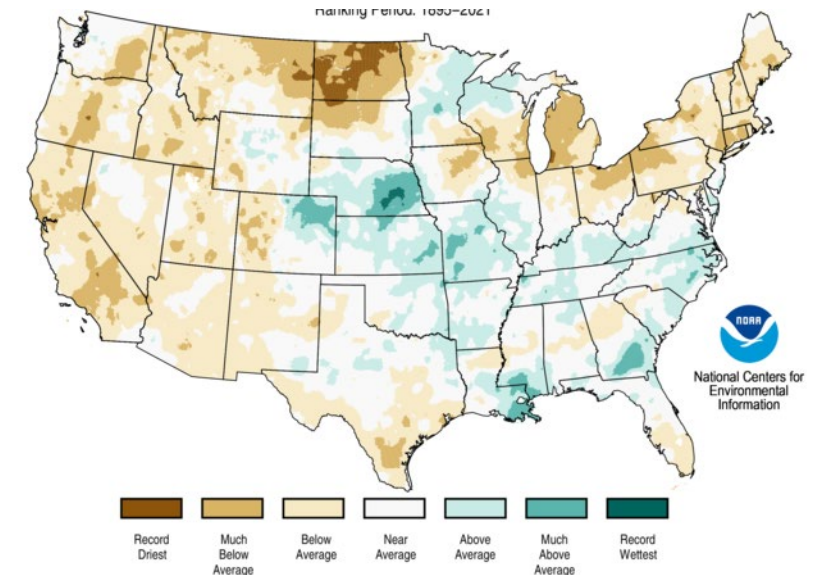
Period: 1895–2021 (127 years)



- Above average over much of the West, Northern Great Plains, Great Lakes, Northeast, and Southeast
- Below average across portions of the Southern Great Plains
- Alaska near average as a whole (warmer over Bristol Bay and Aleutians)

Precipitation Percentiles Jan-Apr 2021

Period: 1895–2021 (127 years)



- Below average across the West, Northern Great Plains and from the eastern Great Lakes through New England
- Above average over the central Great Plains and parts of the Southeast and Gulf Coast
- Above average in Alaska

Current U.S. Drought

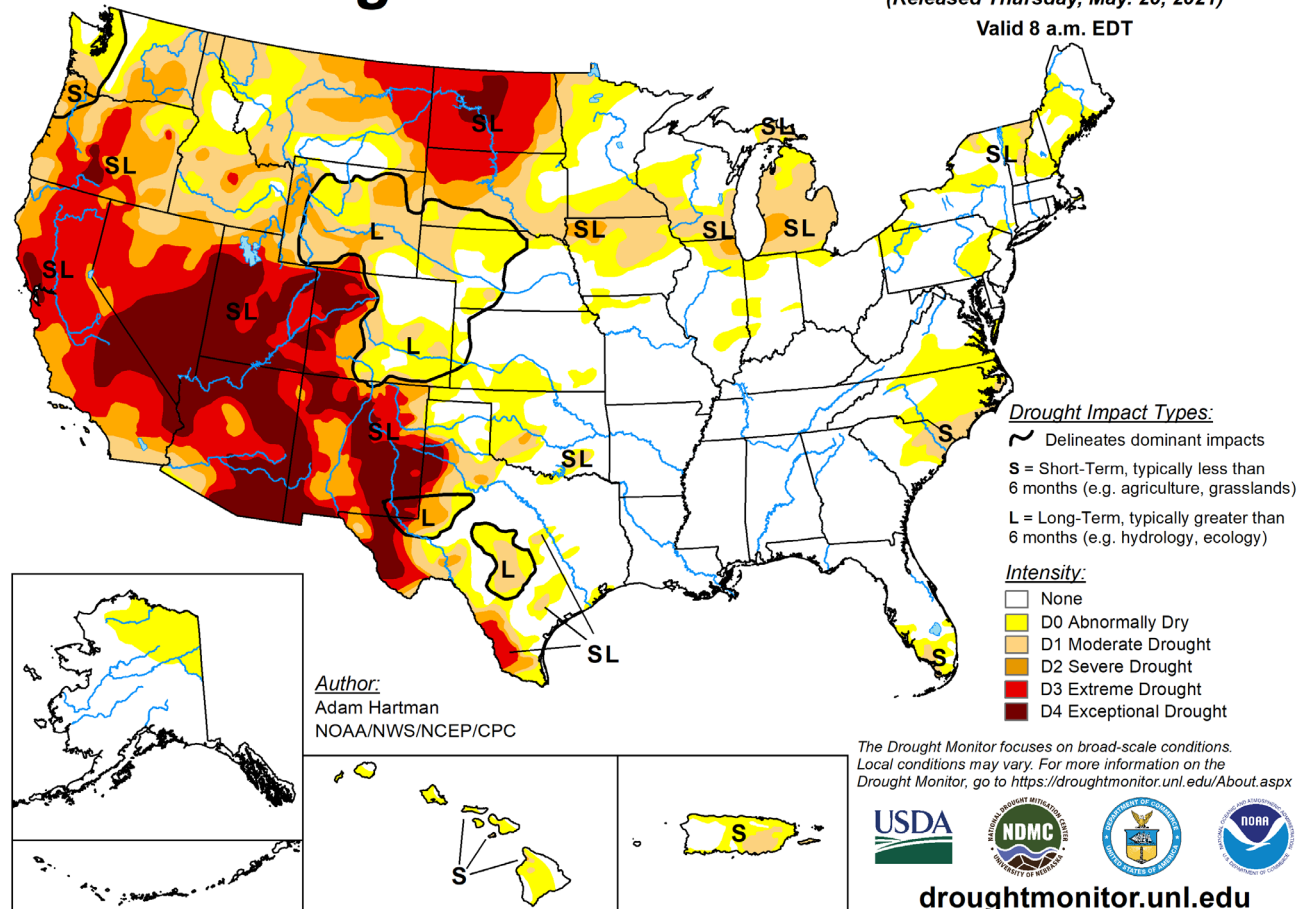
47% of Contiguous U.S. in Drought
(↑ 2 percentage points since mid-April)

U.S. Drought Monitor

May 18, 2021

(Released Thursday, May. 20, 2021)

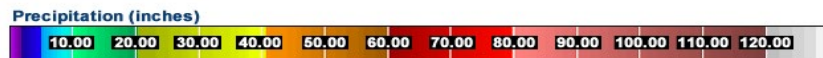
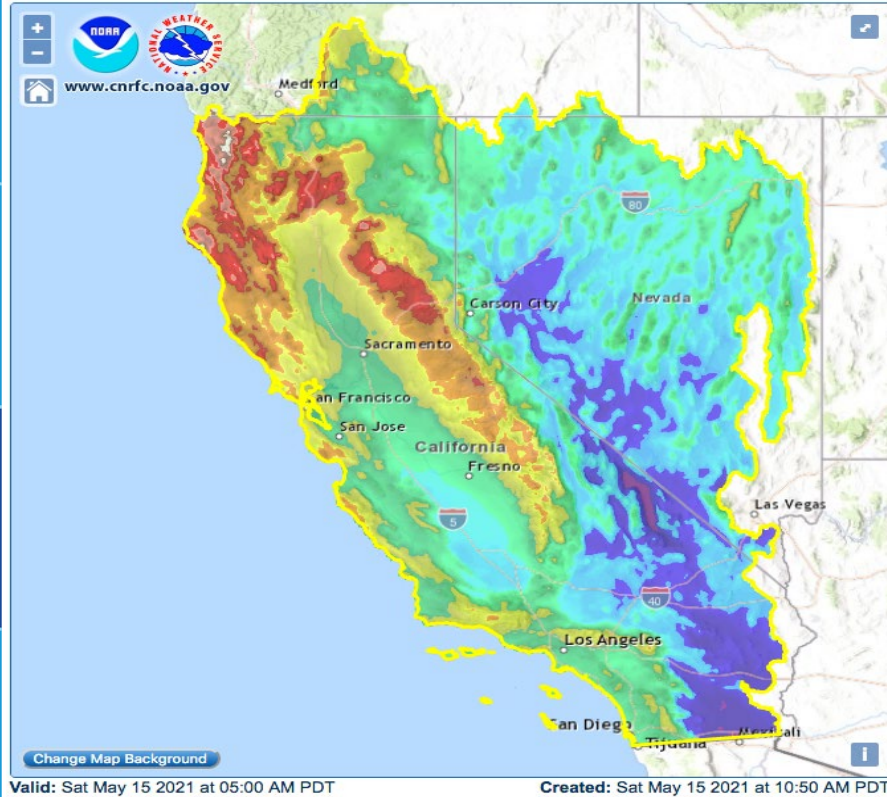
Valid 8 a.m. EDT



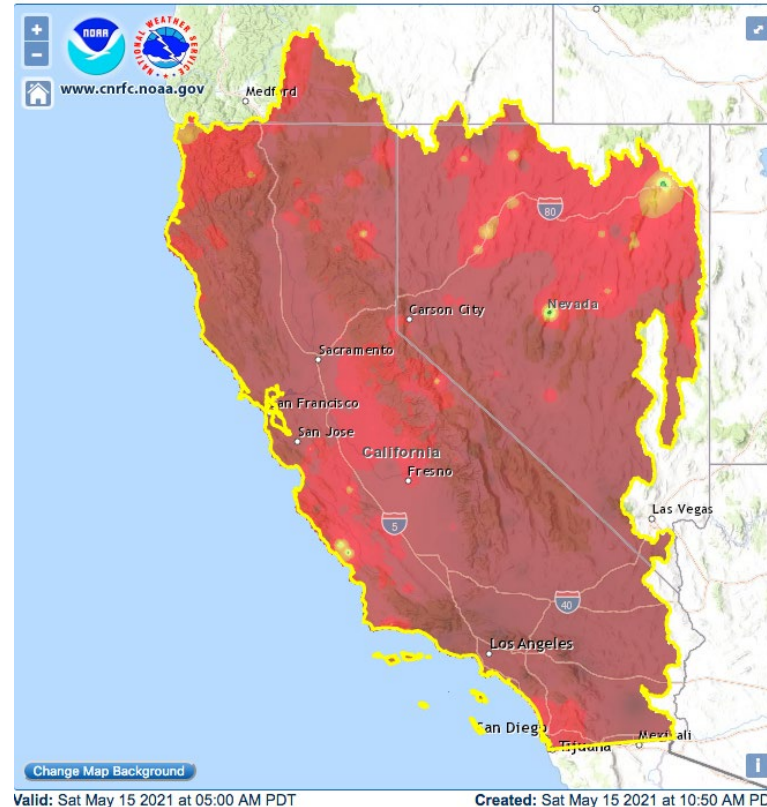
- **Improvement**
Parts of the Northeast, eastern Texas, and southern Florida
- **Degradation**
Pacific Northwest, Upper Great Plains, coastal Carolinas
- **Outside CONUS**
No significant change across Alaska; some degradation in Hawaii and Puerto Rico



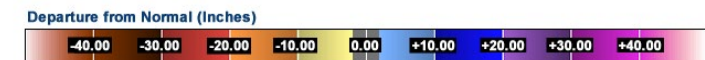
Precipitation Since October 1st



Average to date



Percent of average to date

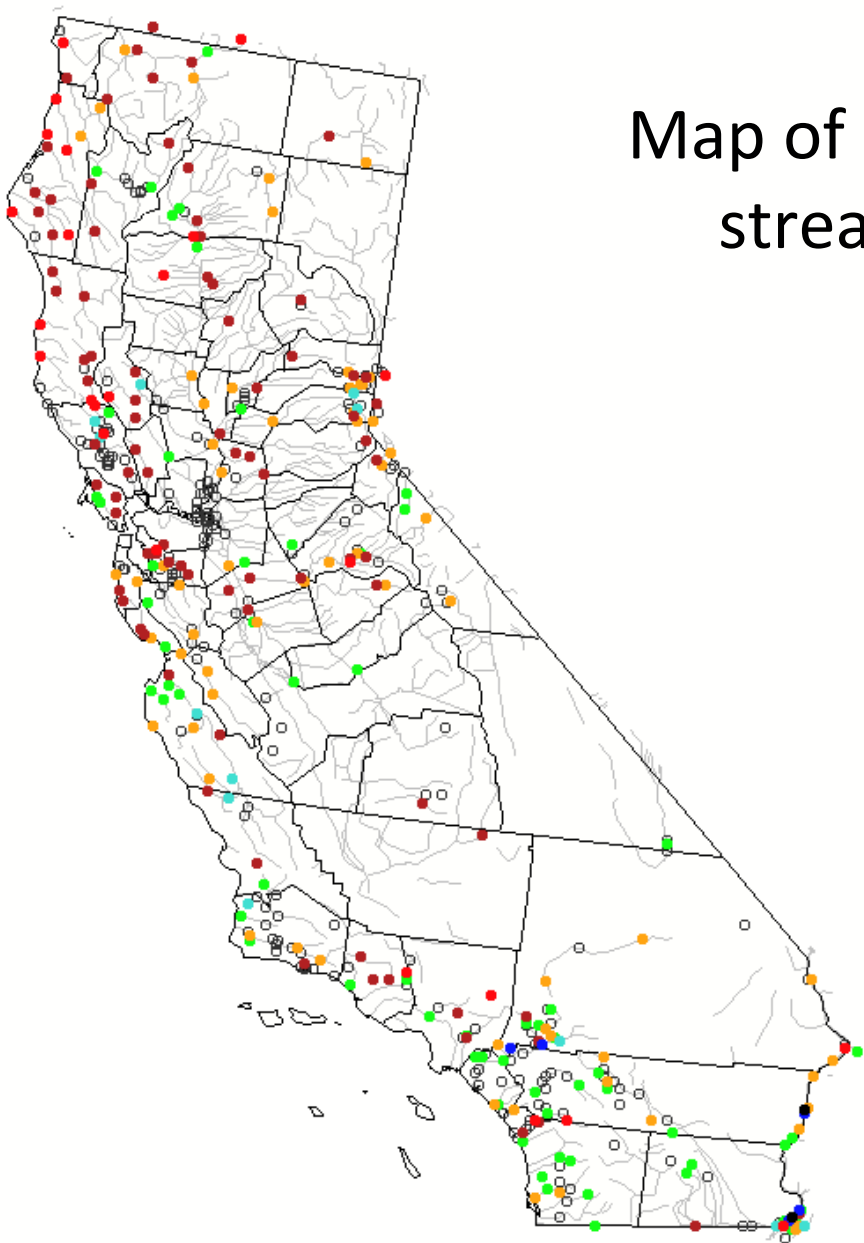


Departure from normal



Anomalously Low Streamflow

Map of real-time streamflow compared to historical streamflow for the day of the year (California)



Search USGS streamgage



Choose a data retrieval option and select a location on the map

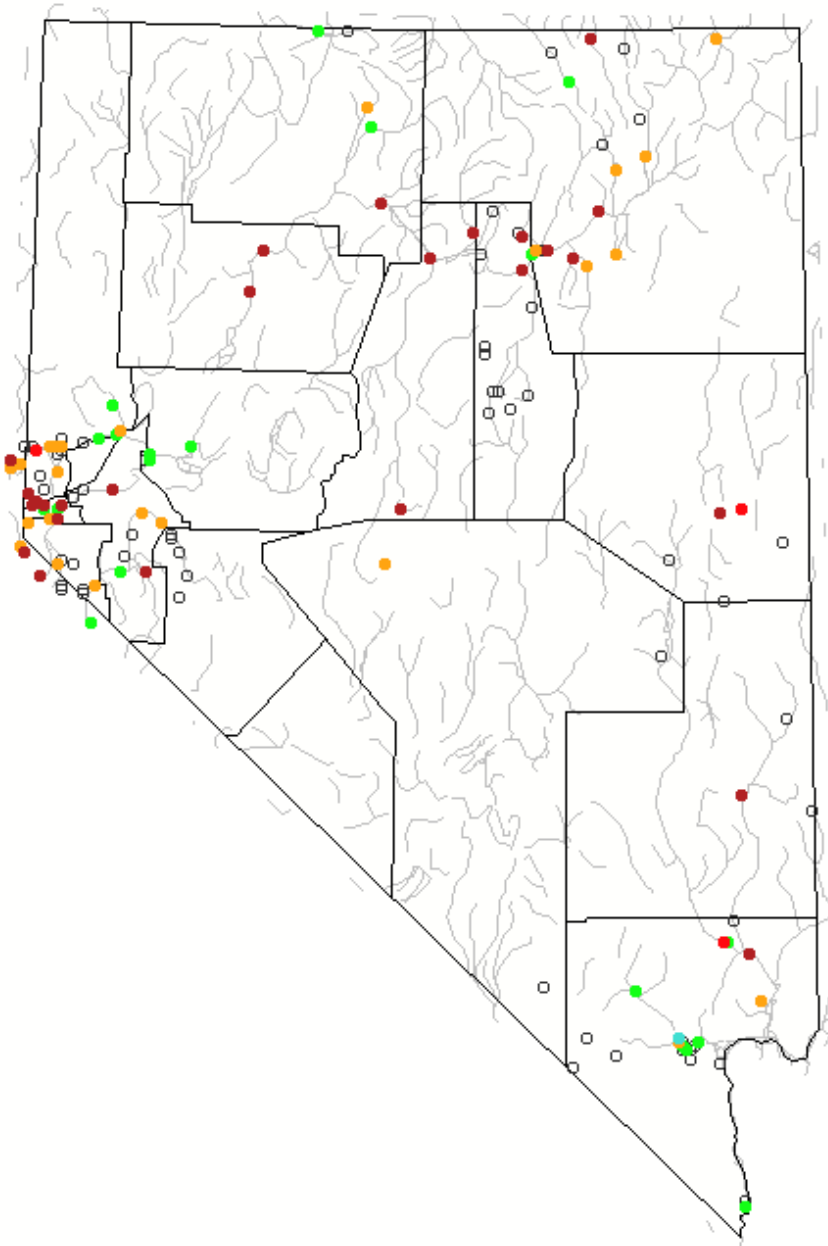
- ☐ List of all stations ☒ Single station ☐ Nearest stations ☐ Peak flow

Explanation - Percentile classes							
Low	<10	10-24	25-75	76-90	>90	High	Not-ranked
	Much below normal	Below normal	Normal	Above normal	Much above normal		

Thursday, May 20, 2021



Anomalous Low Streamflow



Map of real-time streamflow compared to historical streamflow for the day of the year (Nevada)

Explanation - Percentile classes							
Low	<10	10-24	25-75	76-90	>90	High	Not-ranked
	Much below normal	Below normal	Normal	Above normal	Much above normal		

Thursday, May 20, 2021

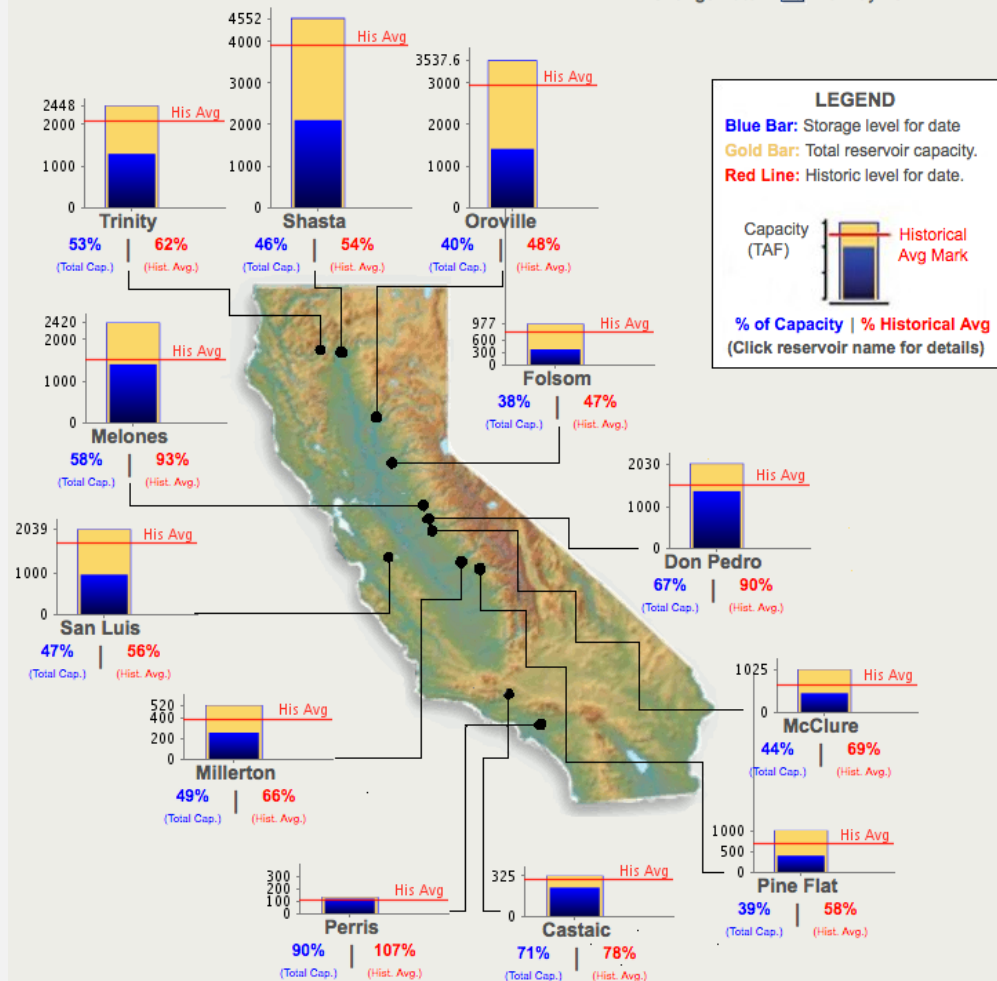


Low Reservoir Storage

CURRENT CONDITIONS FOR MAJOR RESERVOIRS: 18-MAY-2021

Data as of Midnight: 18-May-2021

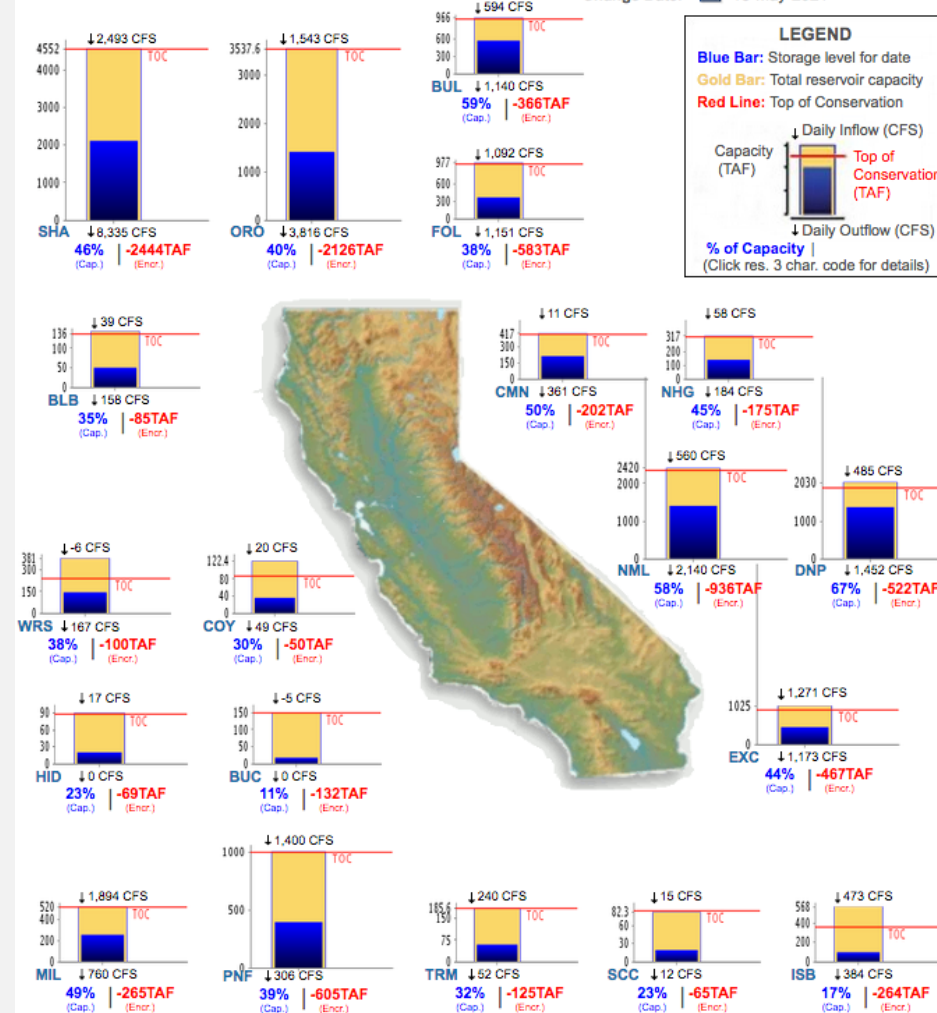
Change Date: 18-May-2021



TOP OF CONSERVATION CONDITIONS FOR CENTRAL VALLEY AND RUSSIAN RIVER FLOOD CONTROL RESERVOIRS: 18-MAY-2021

Data as of Midnight: 18-May-2021

Change Date: 18-May-2021





Projected Runoff

CENTRAL VALLEY - WATER RESOURCES INDEX (MLIC0)

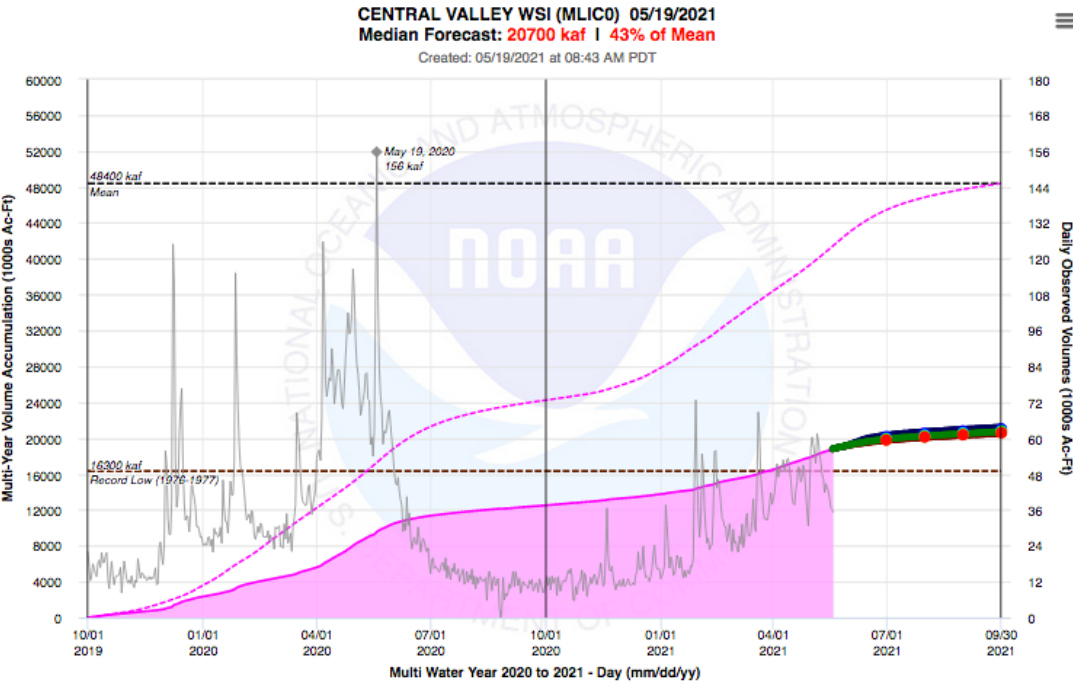
- Sacramento River - Bend Bridge (BDBC1)
- Feather River - Lake Oroville (ORDC1)
- Yuba River - Englebright Reservoir (HLEC1)
- American River - Folsom Lake (FOLC1)
- San Joaquin River - Millerton Reservoir (FRAC1)
- Merced River - Exchequer Reservoir (EXQC1)
- Tuolumne River - New Don Pedro Reservoir (NDPC1)
- Stanislaus River - New Melones Reservoir (NMSC1)

Issuance Time: May 19 2021 at 8:43 AM PDT

PRODUCT NOTE: Ensemble forecasts produced by CNRFC only consider meteorological uncertainty and do not account for hydrologic uncertainty.

2021 Multi-Year Accumulated Volume Plot

CSV Ensemble File Download (Data in kcfs): [Forecast Group](#)



CENTRAL VALLEY - WATER RESOURCES INDEX (MLIC0)

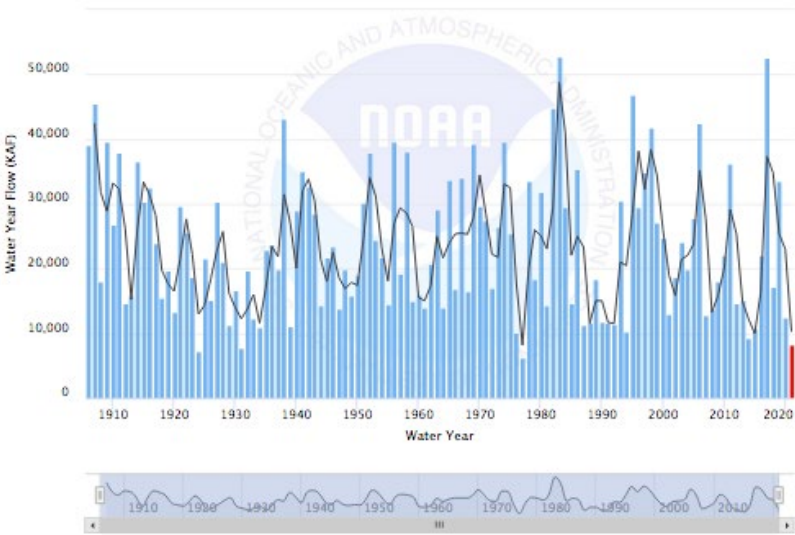
- Sacramento River - Bend Bridge (BDBC1)
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Issuance Time: May 19 2021 at 8:43 AM PDT

Historical Flows

Water Year Seasonal (Apr-Jul)

Water Year Historical Flow for MLIC0

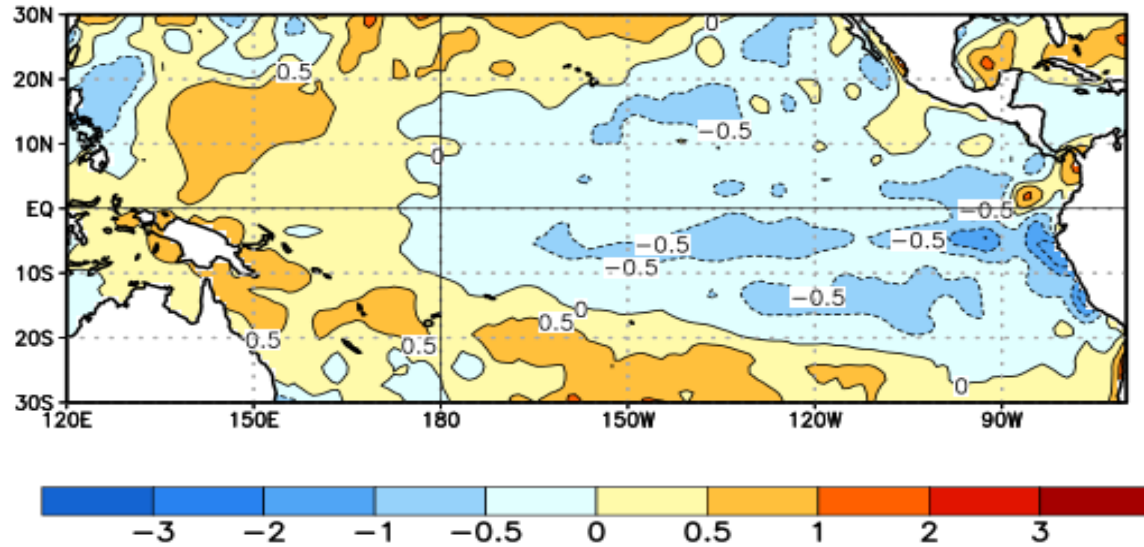


Annual Flow 2-Year Mean

Rank	Year	Annual Flow	2-Year Mean
1	1977	6174.4	8173.6
2	2015	10721.7	9953.8
3	2021	8238.4	10373.1
4	1988	11707.5	11536.1
5	1992	11447.4	11544.4
6	1934	10914.0	11596.4
7	1991	11641.4	11684.4
8	2014	9186.0	12211.4
9	1931	7755.4	12262.2
10	1924	7235.7	12977.2

Sea Surface Temperatures and ENSO

Average SST Anomalies
18 APR 2021 – 15 MAY 2021

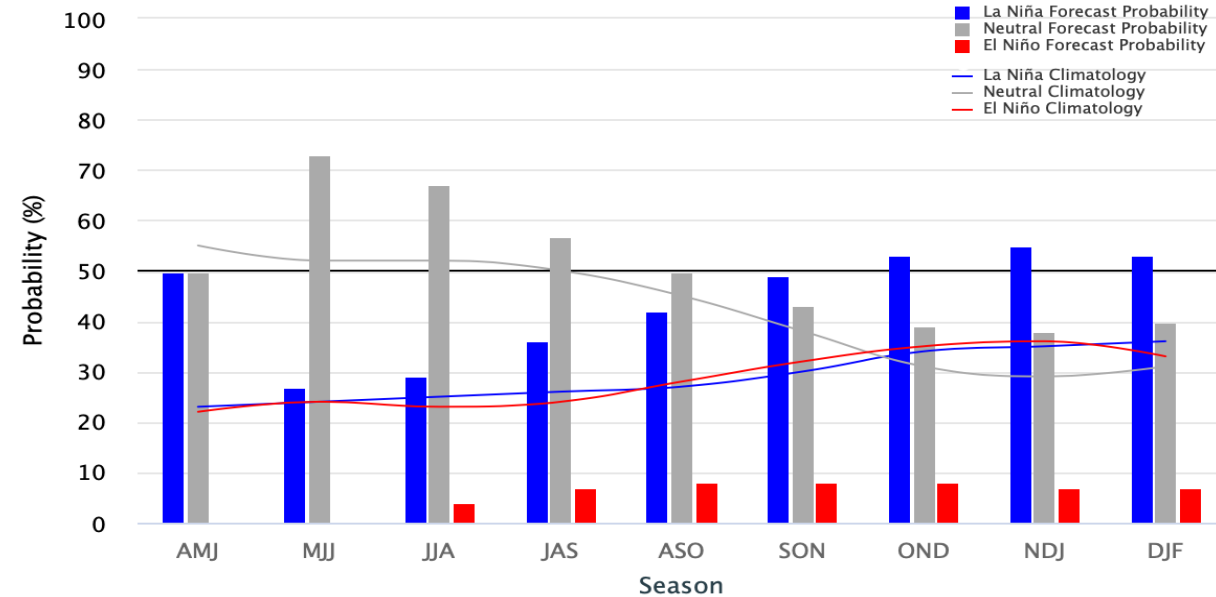


- Sea surface temperatures

- Negative anomalies became smaller recently across the central and eastern equatorial Pacific
- La Niña has ended
- The oceanic and atmospheric observations currently reflect ENSO-neutral conditions

Early-May 2021 CPC/IRI Official Probabilistic ENSO Forecasts

ENSO state based on NINO3.4 SST Anomaly
Neutral ENSO: -0.5°C to 0.5°C



- ENSO forecast

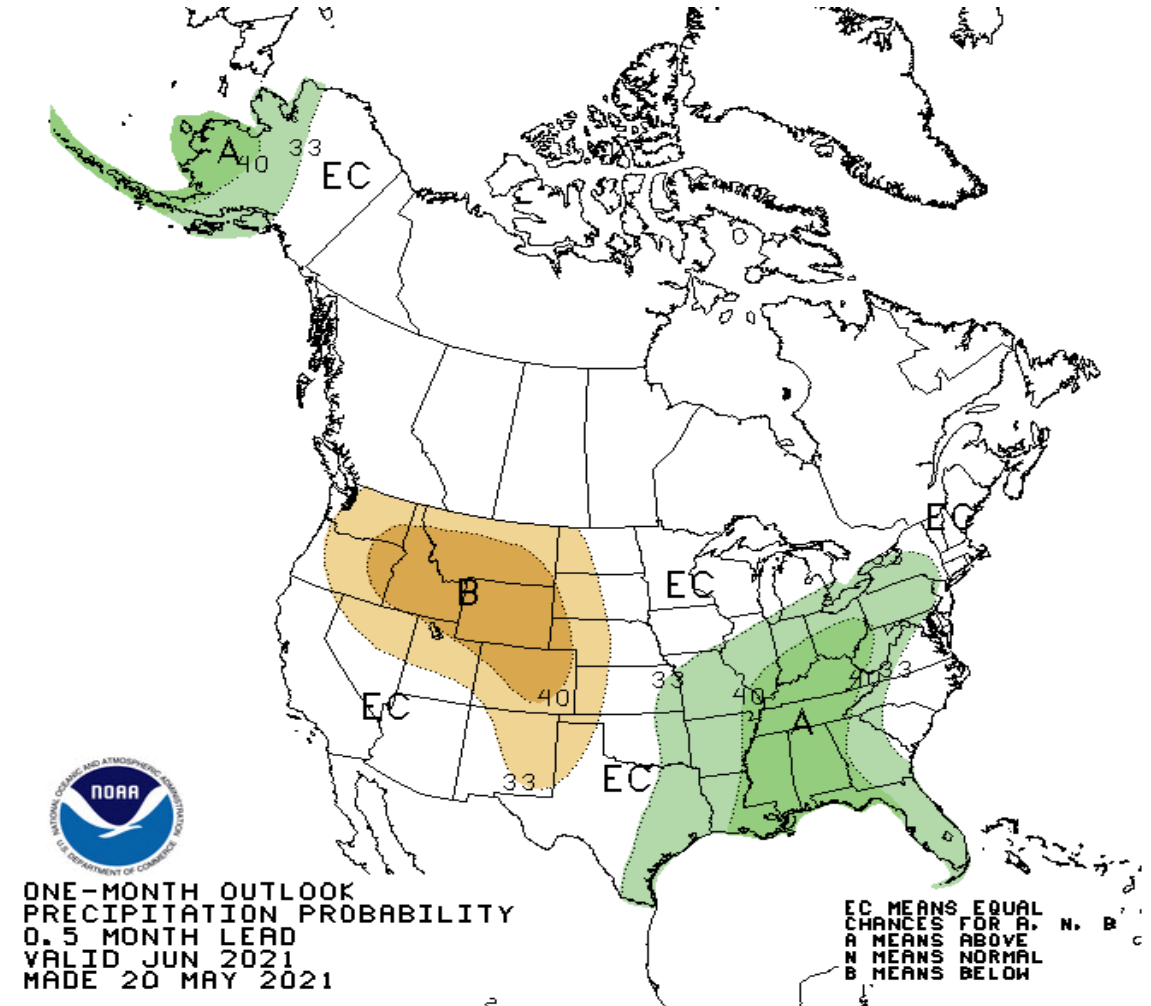
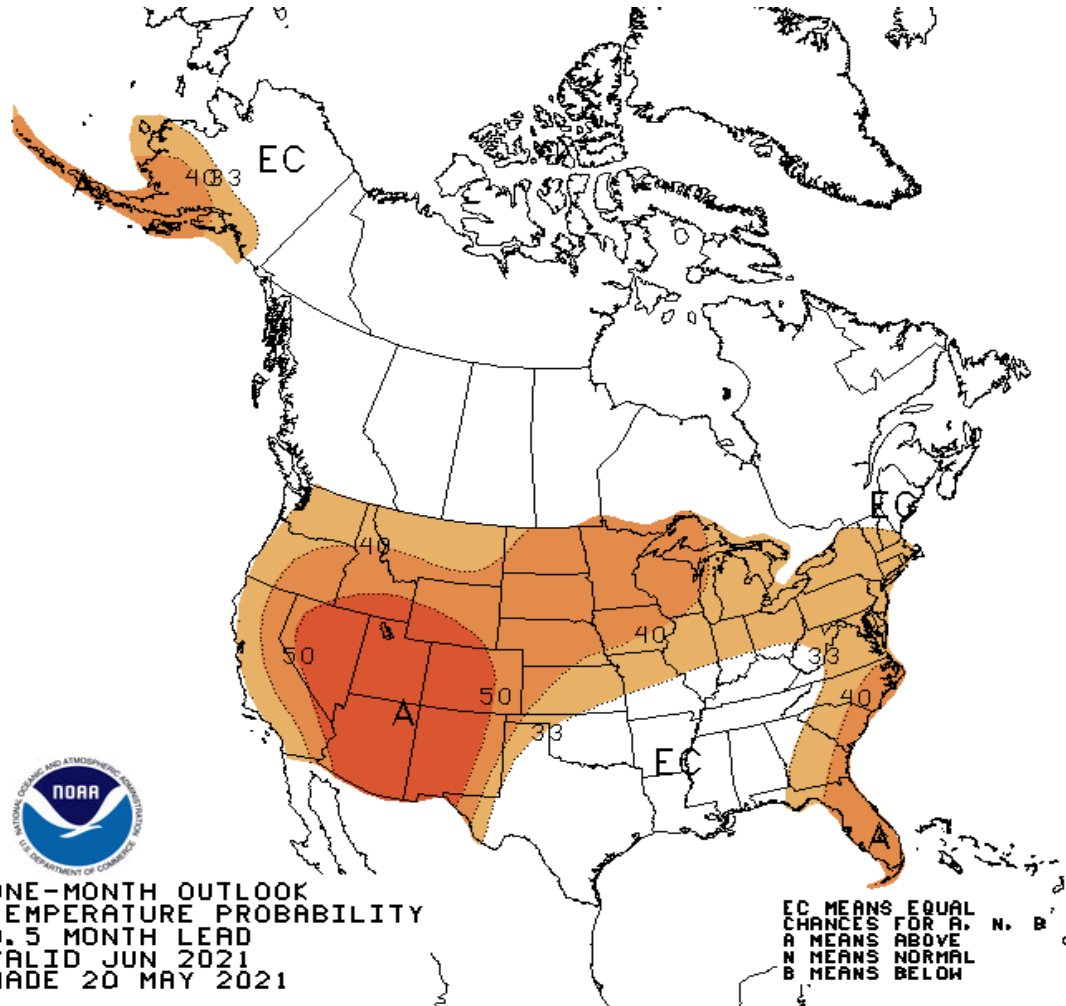
- ENSO-neutral conditions are likely to persist through the summer
- An increasing chance of a return of La Niña exists during the fall and winter 2021-2022



Monthly Forecast (June)

June Average
Temperature Probability

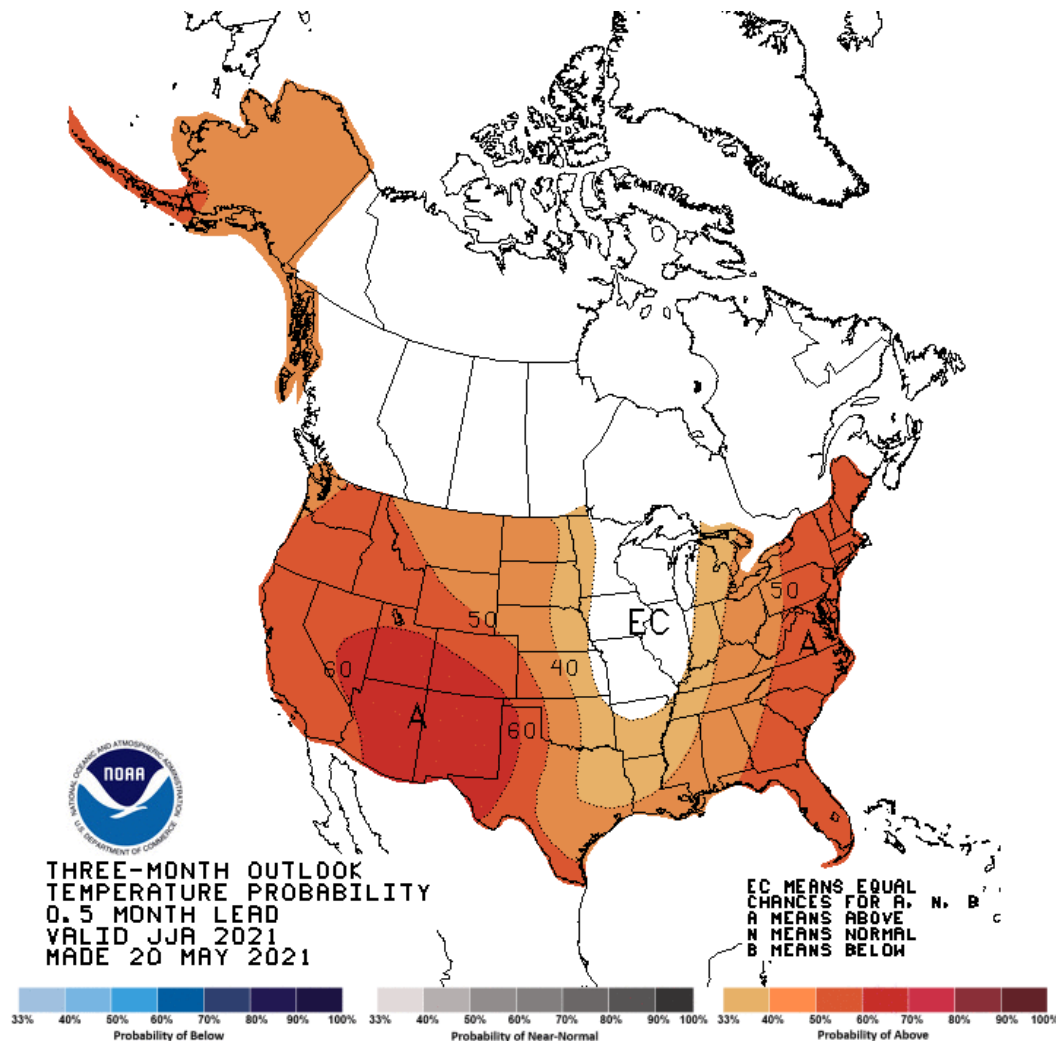
June Total
Precipitation Probability



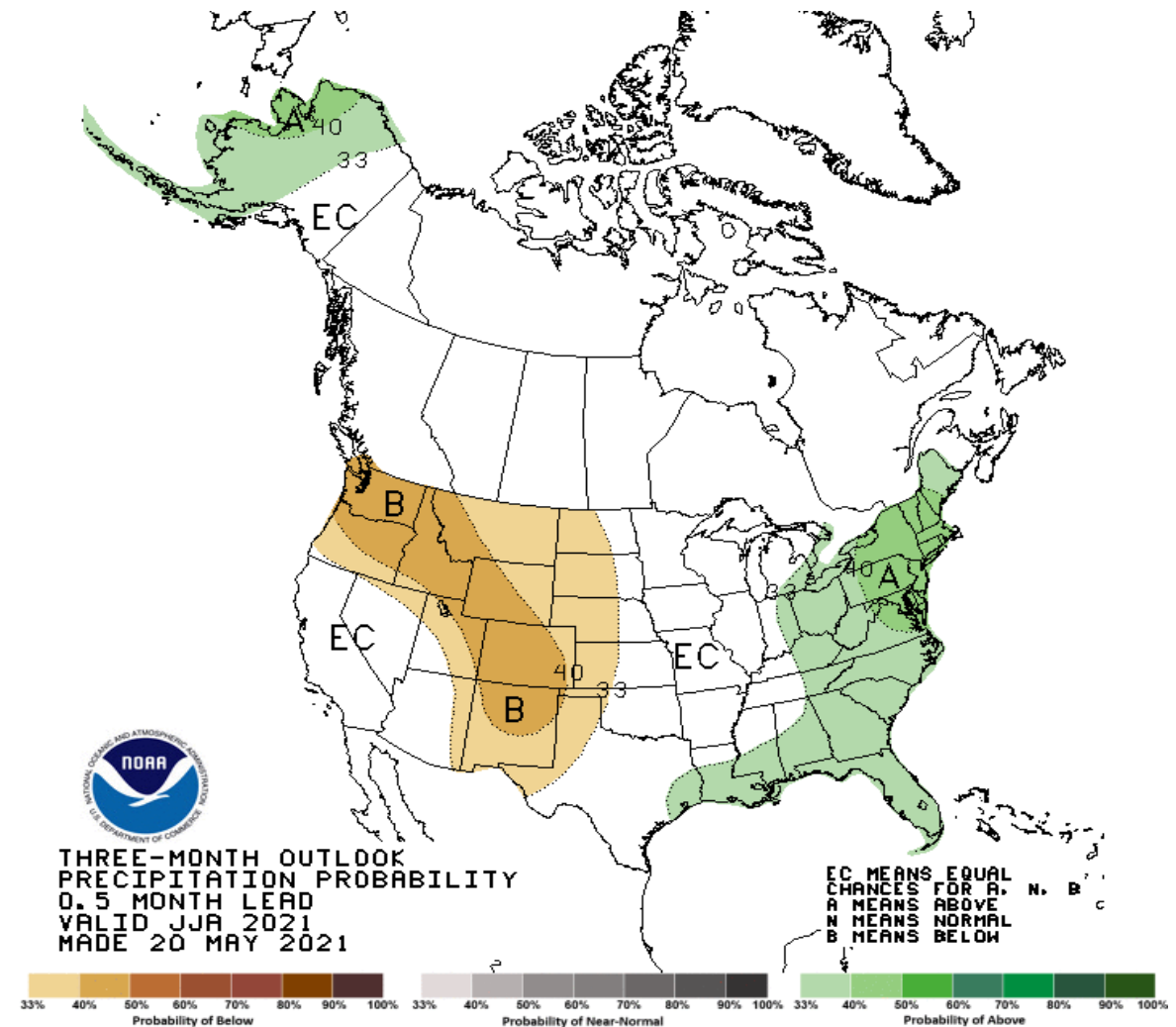


Three-month Forecast (Jun, Jul, Aug)

Jun-Jul-Aug Average
Temperature Probability



Jun-Jul-Aug Total
Precipitation Probability

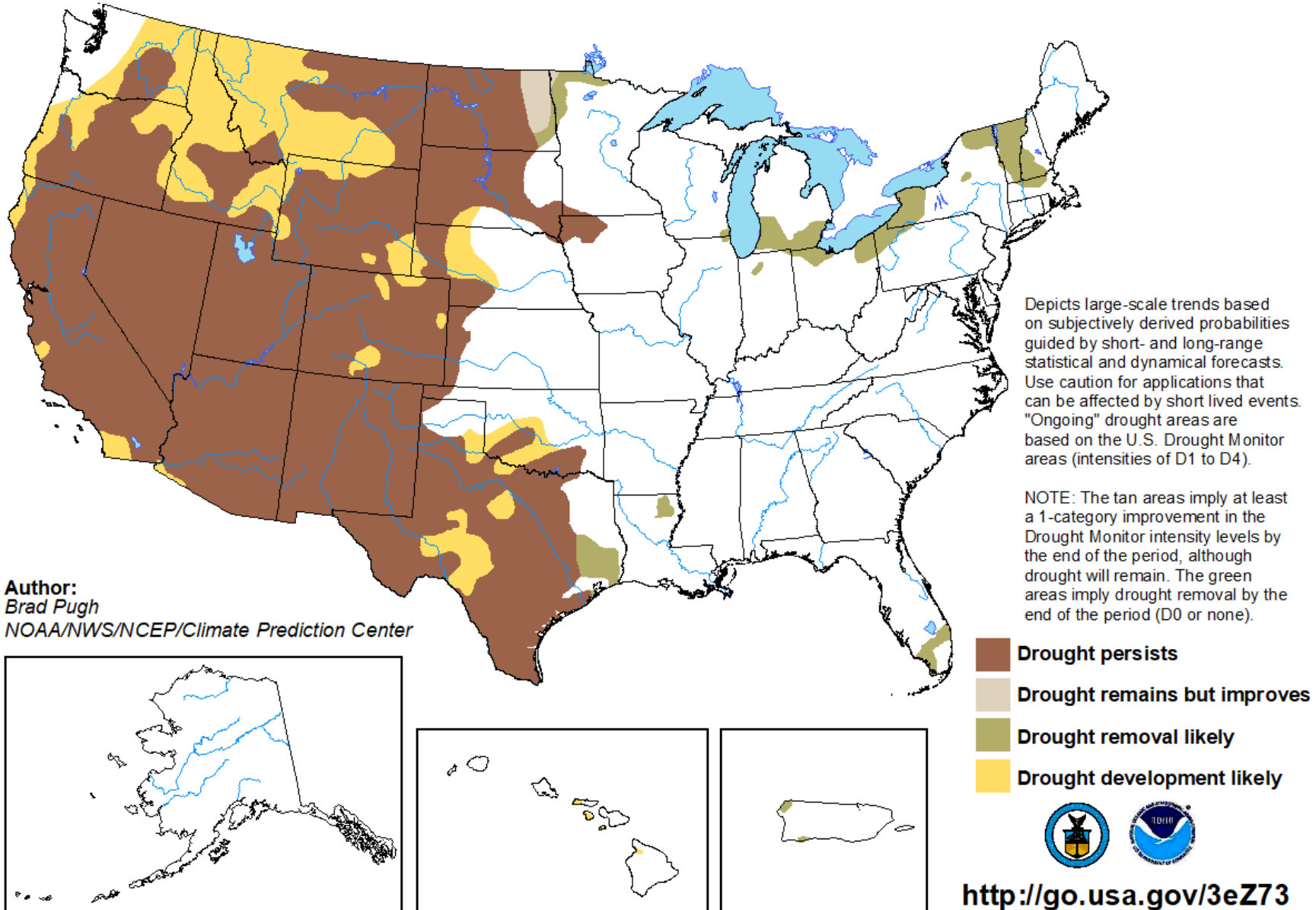




U.S. Seasonal Drought Outlook

Drought Tendency During the Valid Period

Valid for April 15 - July 31, 2021
Released April 15





For More Information



TODAY'S PRESENTATION:

- <http://www.ncdc.noaa.gov/sotc/briefings>

NOAA's National Centers for Environmental Information: www.ncdc.noaa.gov

- Monthly climate reports (U.S. & Global): www.ncdc.noaa.gov/sotc/
- Dates for upcoming reports: <http://www.ncdc.noaa.gov/monitoring-references/dyk/monthly-releases>

NOAA's Climate Prediction Center: www.cpc.ncep.noaa.gov

California Nevada River Forecast Center: <https://www.cnrfc.noaa.gov/>

U.S. Drought Monitor: www.drought.gov

Climate Portal: www.climate.gov

NOAA Media Contacts: john.jones-bateman@noaa.gov, 301-713-9604 (NOAA/NESDIS PAO)